

Date: Wednesday, 13/08/2008 10:55:06 AM
User: Julie Lecocq

Process Sheet

Customer :	CU-DAR001 Dart Helicopters Services	Drawing Name :	BLADE FITTING	
Job Number :	41206			
Estimate Number :	12300			
P.O. Number :		Part Number :	D3488042 041	
This Issue :	13/08/2008	S.O. No. :		
Prsht Rev. :	NC	Drawing Number :	D3488 / DSK101	
First Issue :	//	Project Number :	N/A	
Previous Run :	38787	Drawing Revision :	B / D	
	Type :	Material :		
	MACHINED PARTS	Due Date :	15/09/2008	Qty: 20 Um: Each
Written By :				
Checked & Approved By :	JLM 08.8.13			
Comment :	Est Rev:A New Issue 06-02-28 JLM Est Rev:B As per Rev B 06-03-30 JLM Est Rev:C Now On Doosan Lathe JLM Verified BY:DD			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D6103003	Round Billet, Aluminum
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 20.0000 Each(s)
 Alluminum Round Billet D6103-003
 Batch: 841609

J.F. 08/09/11 (20)

2.0	DOOSAN LATHE	DOOSAN LATHE
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(P2) →

Comment: DOOSAN CNC LATHE
 1-Turn as per Dwg DSK 101 & Folio FA627

2-Deburr

J.F. 08/09/11 (20)

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
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Comment: INSPECT PARTS AS THEY COME OFF MACHINE

J.F. 08/09/11 (20)

4.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
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Comment: HAAS CNC VERTICAL MACHINING #1

1-Machine as per Folio FA627 & Dwg D3488

2-Deburr

JL 08/09/11

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3488-041 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR: <u>41206</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
8/8/08	#	One Blade #114 had chatter in Bottom of the Zone. During Remain the inside dia has been oval sized to 2.172"	RF 08.09.08 QSR 042	ACCEPTABLE DEVIATION SEE ATTACHED EXCERPT FROM SR-D350-636-2 Rev B	JF. 08/09/08		RF 08.09.08 QSR 042	
		Supposed to be 2.170±0.005"						
		EC chip was caught on Boring Bar.						

NOTE: Date & initial all entries

Date: Wednesday, 13/08/2008 10:55:06 AM
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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BLADE FITTING

Job Number: 41206

Part Number: D3488042 041

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

J.L 08/09/22

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

SrB 08/09/22

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

M-h

08/04/22

8.0

POWDER COATING

POWDER COATING



M108523



(20X) (P10)

Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

10:20
320:00
10:50

M-h

08/04/25

9.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

08:09-25

(x20)

10.0

ALS71032225

INSERT



Comment: Qty.: 4.0000 Each(s)/Unit Total: 80.0000 Each(s)

Pick:

Qty Part Number Description Batch

4 ALS7-1032-225 Insert

M100621

M-h

11.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Install Inserts as per Dwg D3488

M-h

08/09/25

(20X)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3488-041 PAR #: N/A Fault Category: Prod/Machined Parts NCR: Yes No DQA: D Date: 08/09/30
QA: N/C Closed: D Date: 08/09/30

NCR: <u>41206</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
8/9/25	#80	Durbin powder coating it was noticed that all 80 we left none not Right HAND.		change all Qty <u>(80)</u> to - 041's.	<u>J. F.</u> 08/09/25	<u>S</u> 08/09/25		<u>S</u>
		^{made} R.C operator made lefts with out checking		- train machinist to know different of Left and Right	<u>J. F.</u> 08/09/25	<u>S</u> 08/09/25		<u>S</u> 08/09/25

NOTE: Date & initial all entries

Date: Wednesday, 13/08/2008 10:55:06 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BLADE FITTING

Job Number: 41206

Part Number: D3488042041

Job Number:



Seq. #:

Machine Or Operation:

Description :

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 08/08/25 *20

13.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

F-P-7

M-1

08/09/25

20X

14.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

08/09/30

Job Completion



MF 08-09-30

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 41206
Description: Blade Fitting LH, RH	Part Number: 03488-1/2
Inspection Dwg: 03488, Rev: B	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

Lathe (DOOSA) ☒ First Article ☒ Prototype

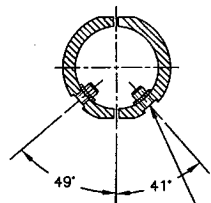
Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø 2.150"	± .005"	Ø 2.150"				
Ø 2.780"	± .005"	Ø 2.780"				
Ø 3.125"	± .010"	Ø 3.125"				
Ø 3.346"	± .010"	Ø 3.346"				
.125 x 45°	± .010"	.115 x 45°				
8.000"	+ .030 - .030	8.000"				
9.250"	± .010"	9.250"				
.188"	± .010"	.188"				
R.032"	± .010"	R.032"				
R.062"	± .010"	R.062"				
Ø .297"	+ .005 - .001	Ø .299"				
Ø .430"	± .010"	Ø .432"				
.100"	± .010"	.105"				
.125"	± .010"	.127"				
2.620"	± .010"	2.619"				
3.500"	± .010"	3.500"				
1.005"	± .010"	1.004"				
Ø .484"	+ .005 - .001	Ø .485"				
1.180"	± .010"	1.181"				
3.150"	± .010"	3.151"				
3.070"	± .010"	3.070"				
8.000"	+ .030 - .000	8.005"				
R.063"	± .010"	R.063"				

Measured by: J.F.
Date: 08/09/11

Audited by: [Signature]
Date: 08/09/22

Prototype Approval: [Signature]
Date:

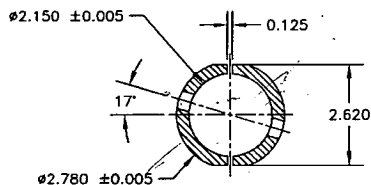
Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	



SECTION B-B

Ø0.297
C'BORE Ø0.430 x 0.100
INSTALL ALS4-1032-225 (OR AKS4-1032-225
OR ALS7-1032-225 OR AKS7-1032-225)
INSERTS AFTER FINISH
(4 PLACES)

4



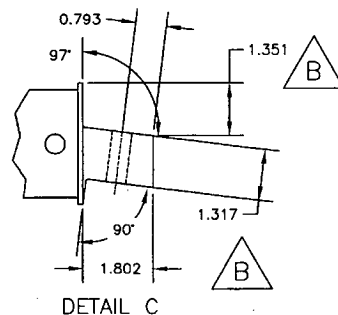
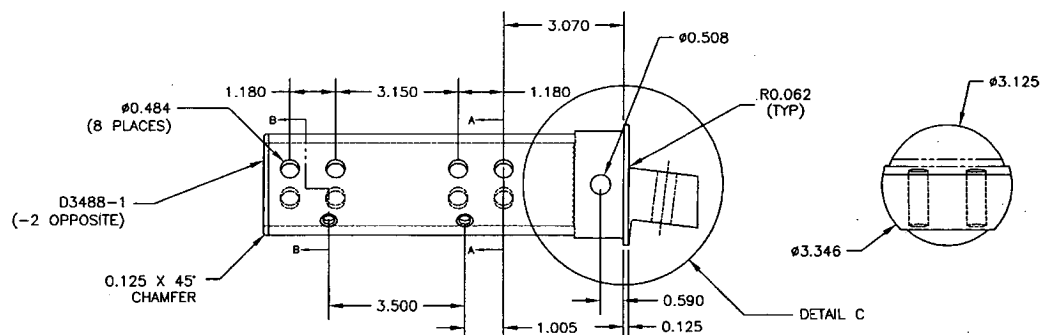
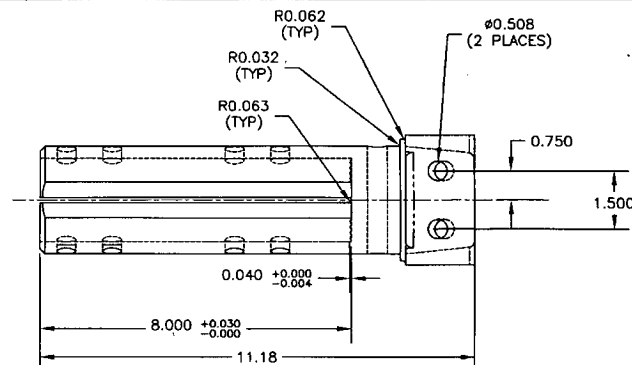
SECTION A-A

D3488-041/-042 BLADE FITTING ASSEMBLY PARTS LIST

QTY -041	QTY -042	PART NUMBER	DESCRIPTION
X	X	D3488-041	BLADE FITTING ASSEMBLY (LH)
		D3488-042	BLADE FITTING ASSEMBLY (RH)
1		D3488-1	BLADE FITTING (LH)
	1	D3488-2	BLADE FITTING (RH)
4	4	ALS4-1032-225 or AKS4-1032-225 or ALS7-1032-225 or AKS7-1032-225	INSERT

D3488-041/-042 BLADE FITTING

- MATERIAL: MAKE D3488-1/-2 FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9 (REF. DART MATERIAL SPEC M7075T73R)
- FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
- BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
- INSTALL INSERTS AFTER POWDER COAT
- ALL DIMENSIONS ARE IN INCHES
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED



DETAIL C

D3488-041 SHOWN (D3488-042 OPPOSITE)

RELEASED
06.03.15 PH
PER DS
ECN #789

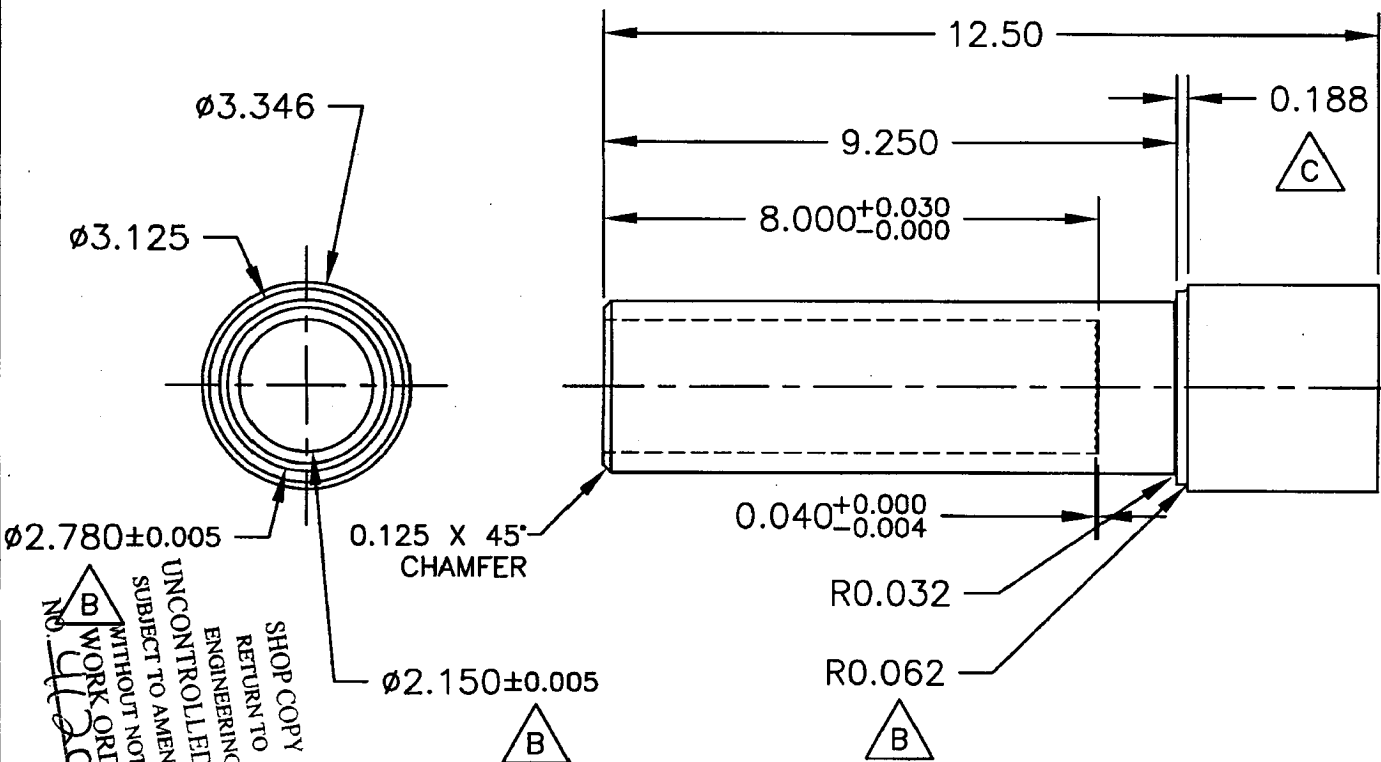
B	06.03.15	CHANGE THICKNESS
A	05.12.20	NEW ISSUE
DESIGN	PH	DRAWN BY PH
CHECKED	#	APPROVED #
DATE	06.03.15	TITLE
		BLADE FITTING
		DART DART AEROSPACE USA, INC. PORT HADLOCK, VA
		DRAWING NO. D3488
		REV. B
		SHEET 1 OF 1
		SCALE 1:3

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DART

DESIGN	DRAWN BY	DART AEROSPACE USA, INC.	
PH	PH	PORT HADLOCK, WA	
CHECKED	APPROVED	DRAWING NO.	REV. D
PH	PH	DSK 101	SHEET 1 OF 1
DATE	TITLE	SCALE	
06.05.09	D3488-1/-2 TURNING DETAIL	1:3	
A	05.12.21	NEW ISSUE	
B	06.03.02	ADD TOLERANCES AND RADIUS	
C	06.04.17	0.188 WAS 0.125	
D	06.05.09	REMOVE DIAMETER FOR CHAMFER	



- 1) MATERIAL: MAKE FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9 (REF. DART MATERIAL SPEC M7075T73R)
- 2) FINISH: NONE
- 3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

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SR-D350-636-2

Page 6 of 7

per DWG D843, dim ~~2.701~~ $\phi 2.172 \pm 0.005$ is $\phi 2.172$
2.150

01.09.03 1 of 2

For installation of the Apical Tri-bag and Apical Cylindrical Float bag systems onto OEM skid tubes; it is required that the OEM P/N 350A41-1077-24/-25 blade fitting be substituted with the Apical P/N 20473-7/-8 blade fitting. In the proposed Dart skid tube configuration, the Dart D3488-041/-042 blade fitting will replace the Apical P/N 20473-7/-8 blade fitting.

In the Dart system, blade fitting D3488-041/-042 will be used to transfer load into the web of the skid tube assembly. On the outside of the skid tube, D3488-041/-042 is dimensionally identical to the Apical P/N 20473-7/-8 blade fitting and is manufactured from the same 7075-T7351 material. Therefore, the Dart blade fitting and the Apical blade fitting have identical structural capability. The longitudinal location of the holes on the D3488-041/-042 blade fitting used to mount the aft crosstube are identical to the Apical P/N 20473-7/-8 blade fitting. On the inside of the skid tube, D3488-041/-042 has been designed to withstand higher bending moments than the Apical fitting.

The following table compares the Dart D3488-041/-042 blade fitting to the Apical 20473-7/-8 blade fitting.

Deviation
dims

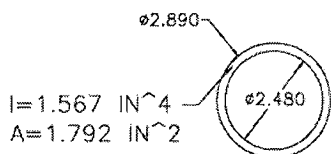
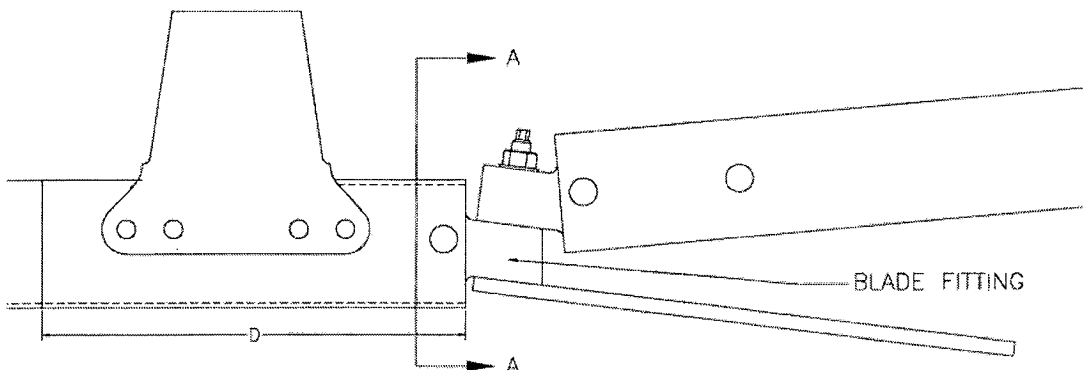
Component	Dart D3488-041/-042	Apical P/N 20473-7/-8
Material	7075-T7351 per QQ-A-225/9	7075-T7351 per QQ-A-225/9
(I) Moment of Inertia of portion inside skid tube	1.620 in ⁴ (from D3488-041/-042 dwg)	1.567 in ⁴ (from D20473-7/-8 dwg)
(C) Distance to outer fibers	1.310 in (from D3488-041/-042 dwg)	1.445 in (from 20473-7/-8 dwg)
(A) Area at section A-A	2.280 in ²	1.792 in ²
Z=I/C at section A-A	1.234 in ³	1.084 in ³
D	10.69 in	10.53 in

1.579

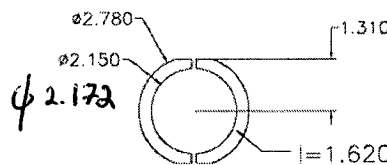
2.209

1.205 1.579

10.69



SECTION A-A
APICAL P/N
20473-7/-8
BLADE FITTING



SECTION A-A
DART P/N
D3488-041/-042
BLADE FITTING

1.579

2.209

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Conclusion: Since I/C, A, D is still greater than Apical P/N 20473-7/-8.
Part is structurally ACCEPTABLE

Revision: B

Date: 06.02.23